

## SWJ-12-T81-3P

### SP8T Motorized Absorptive Switch Matrix with TTL Driver, Manual Override, WR-12, E-Plane

**SWJ-12-T81-3P** is a WR-12 motorized single pole, eight throw (SP8T) transfer switch matrix with a TTL driver that covers the frequency range of 60 to 90 GHz. The matrix includes seven E-plane four-port DPDT switches that are mounted on a base-plate. Unused port of each switch is terminated by matched load to which makes each switch absorptive. The switch matrix has typical insertion loss of 2.6 dB and the typical adjacent-port isolation of 60 dB. Each WR-12 waveguides port is connected to a waveguide to 1.35 mm Female end-launch transition. The bias and control signal is supplied by a 9 pin Micro-D type connector.



#### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
Frequency Range	60 GHz		90 GHz
Insertion Loss**		2.6 dB	
Return Loss		18 dB	
Isolation***		60 dB	
Bias Voltage for Each Switch	+24 VDC	+24 VDC	+28 VDC
Bias Current for Each Switch			1.0 A
Control Signal		DC/TTL	
Switching Time <sup>SEE NOTES</sup>		125 ms	
Switching Cycles		250,000	
Power Handling*			20 W (CW)
Power Handling (Terminated Paths)			2 W (CW)
Specification Temperature		+25°C	
Operating Temperature	-25°C		+65°C

\*Power handling can be 100 W (CW) if waveguide to coax transition is removed.

\*\*Assembly level insertion loss at waveguide ports without waveguide to coax transition.

\*\*\*Isolation level for individual switch. Units tested separately.

#### Mechanical Specifications:

Item	Specification
RF Ports	8 x 1.35 mm (F) and 1x WR-12 Waveguide
Bias / Control Port	9 Pin Micro-D Connector
Switch Body Material / Finish	Aluminum / Chem Film / Black Anodizing
Waveguide Material / Finish	Copper, Brass / Gold Plated
Weight	9.9 lbs.
Outline	WJ-TE8-A

#### ECCN

EAR99

#### FEATURES

- Low Insertion Loss
- High Isolation
- TTL Control

#### APPLICATIONS

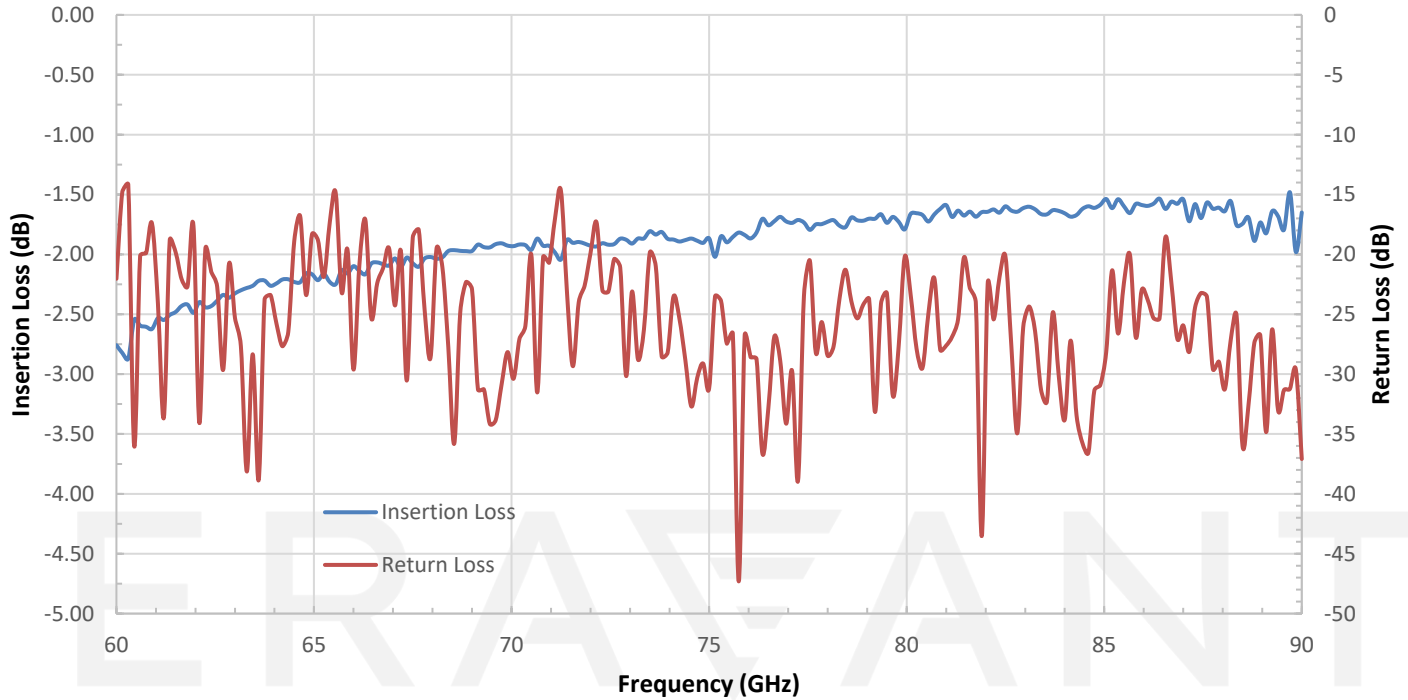
- Test Lab
- Communication Systems
- Radar Systems

#### SUPPLEMENTAL DETAILS

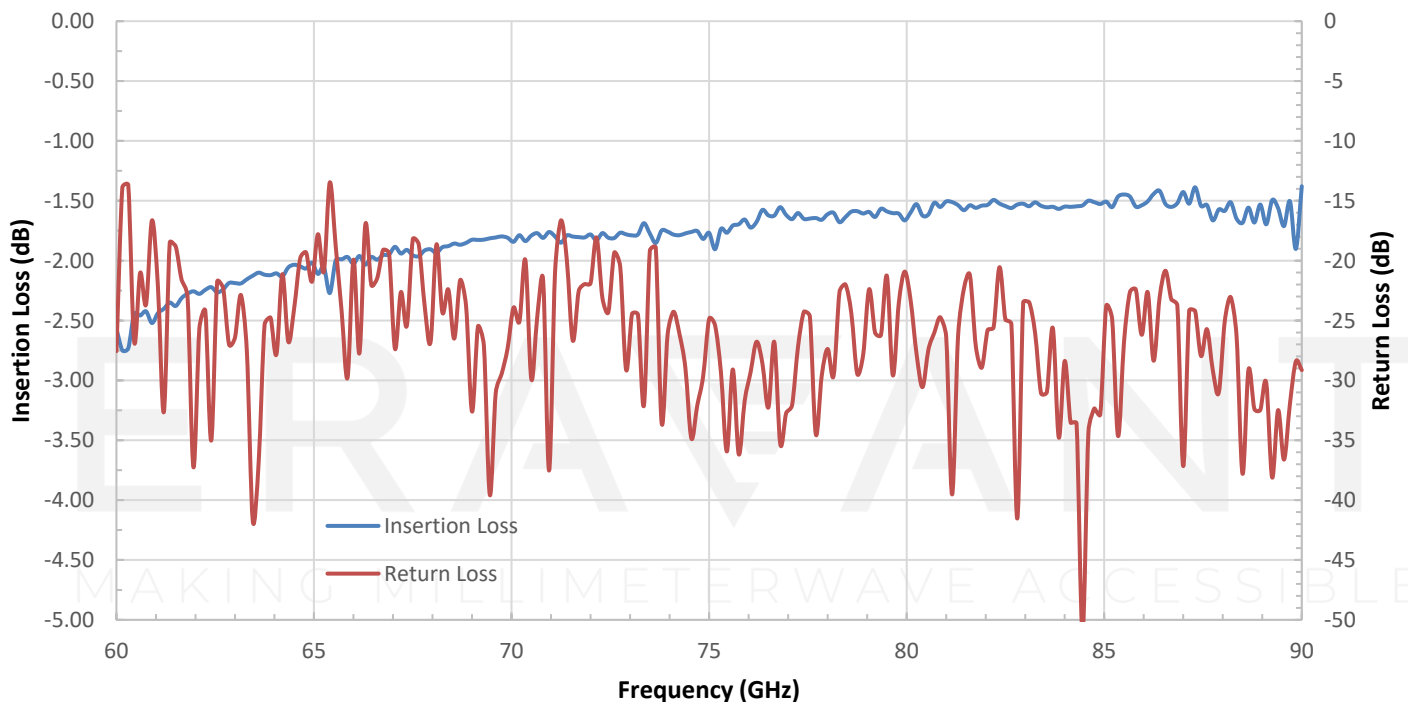


## SWJ-12-T81-3P

Typical Insertion Loss and Return Loss vs. Frequency (Port 1)

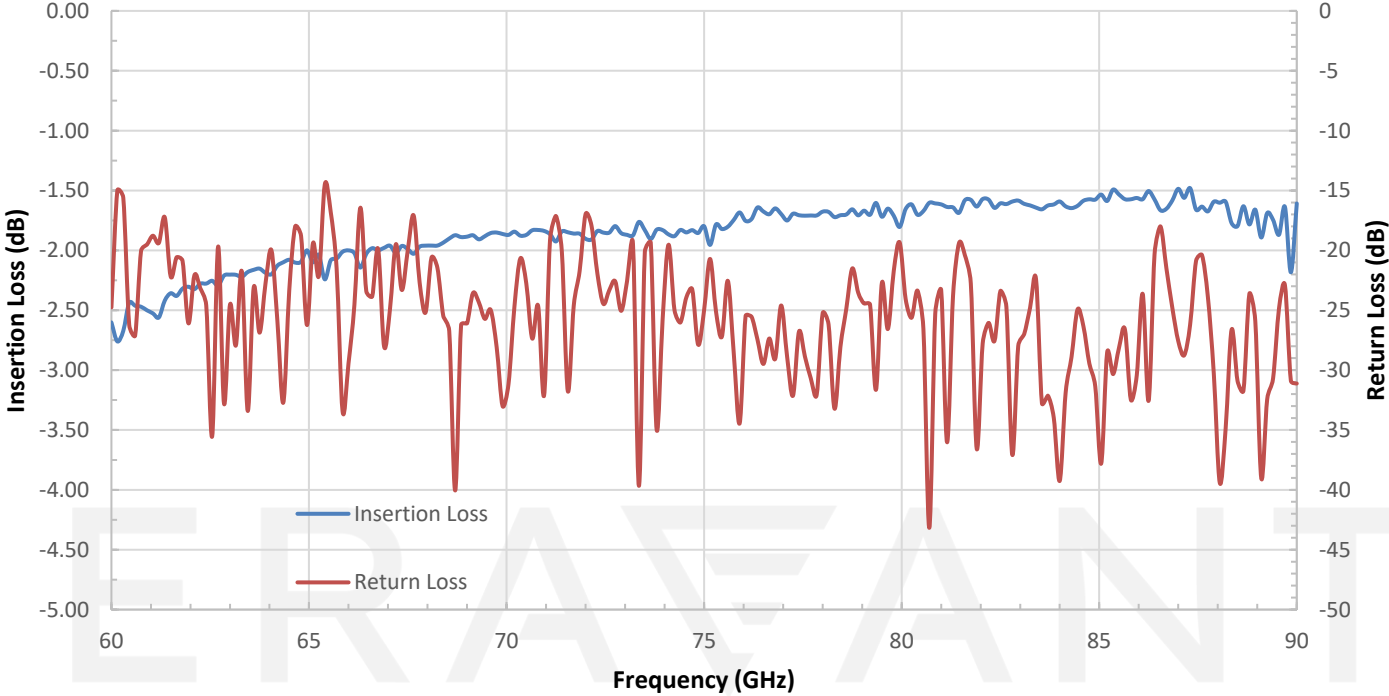


Typical Loss and Return Loss vs. Frequency (Port 2)

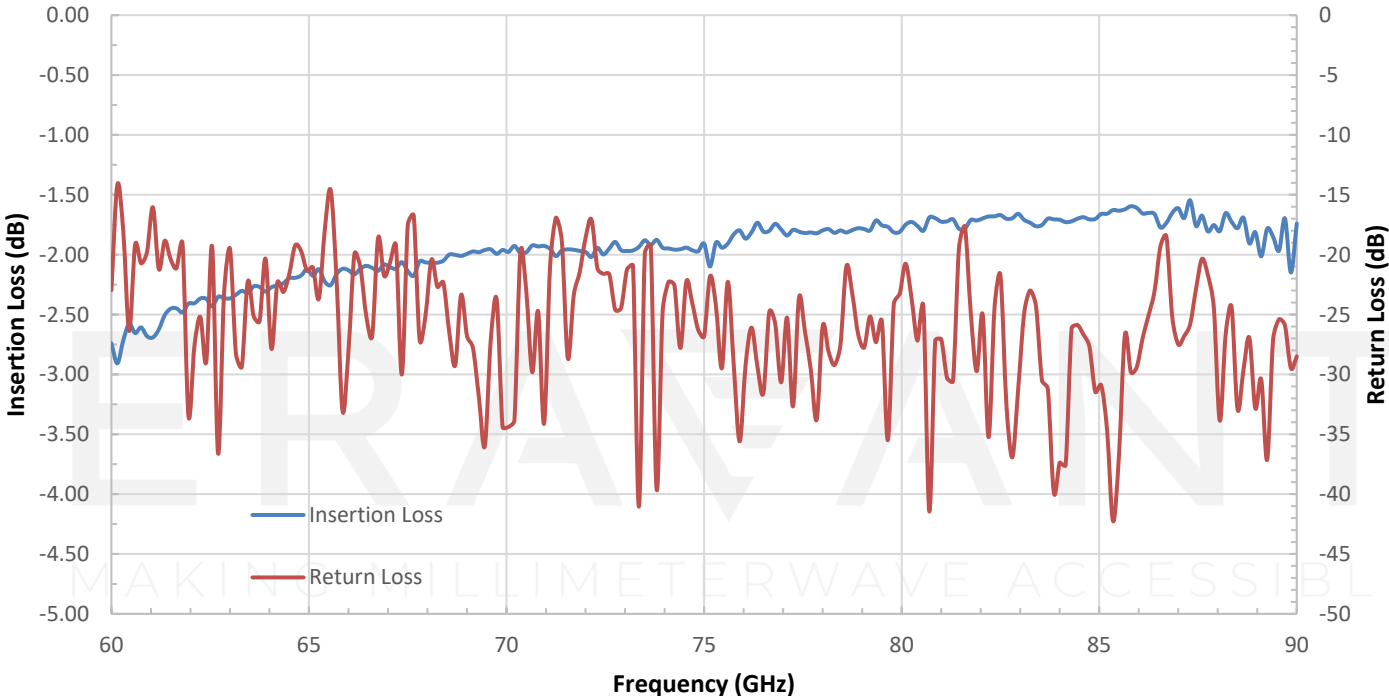


SWJ-12-T81-3P

Typical Insertion Loss and Return Loss vs. Frequency (Port 3)

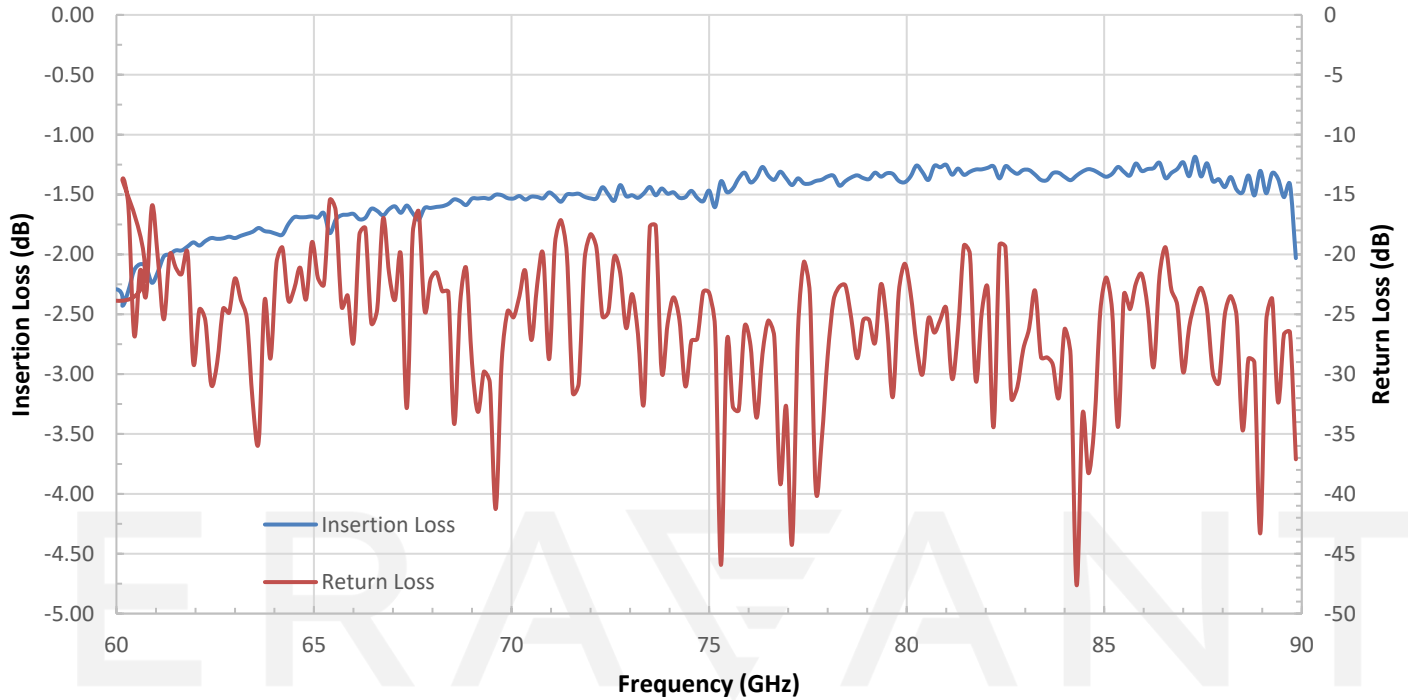


Typical Insertion Loss and Return Loss vs. Frequency (Port 4)

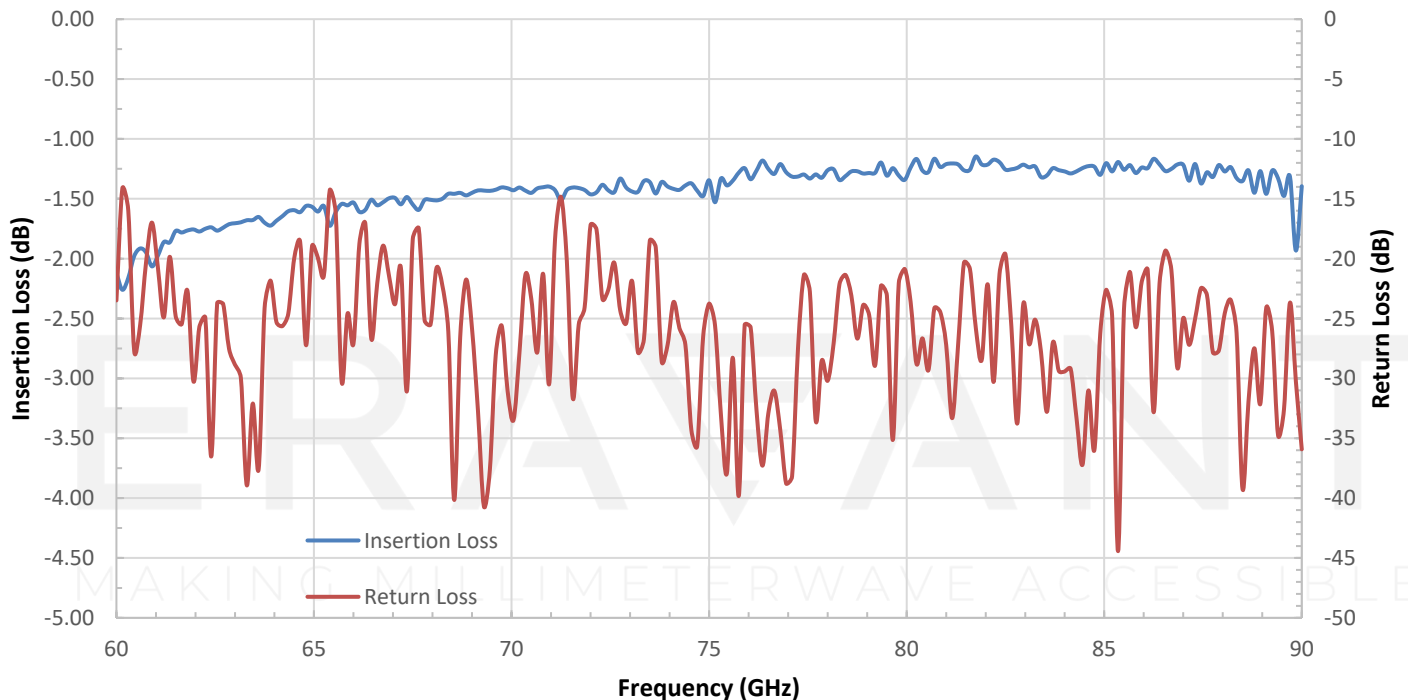


## SWJ-12-T81-3P

Typical Insertion Loss and Return Loss vs. Frequency (Port 5)

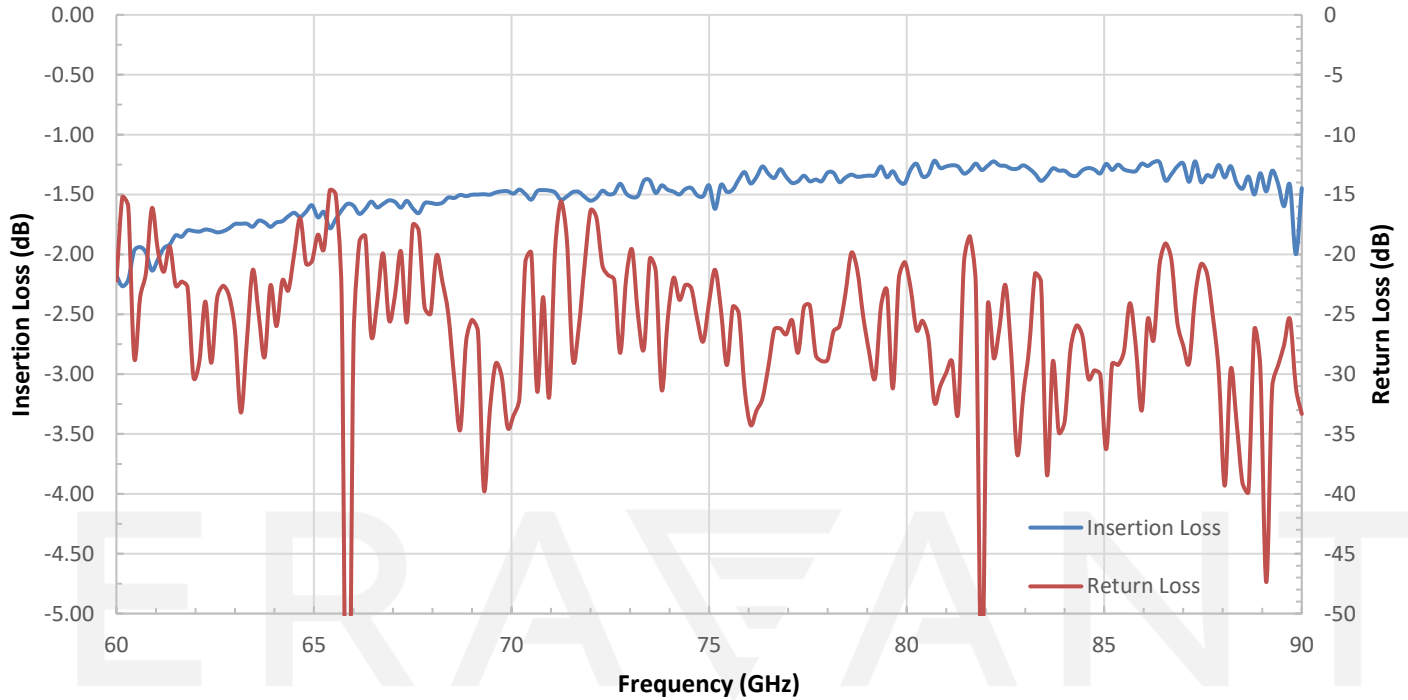


Typical Insertion Loss and Return Loss vs. Frequency (Port 6)

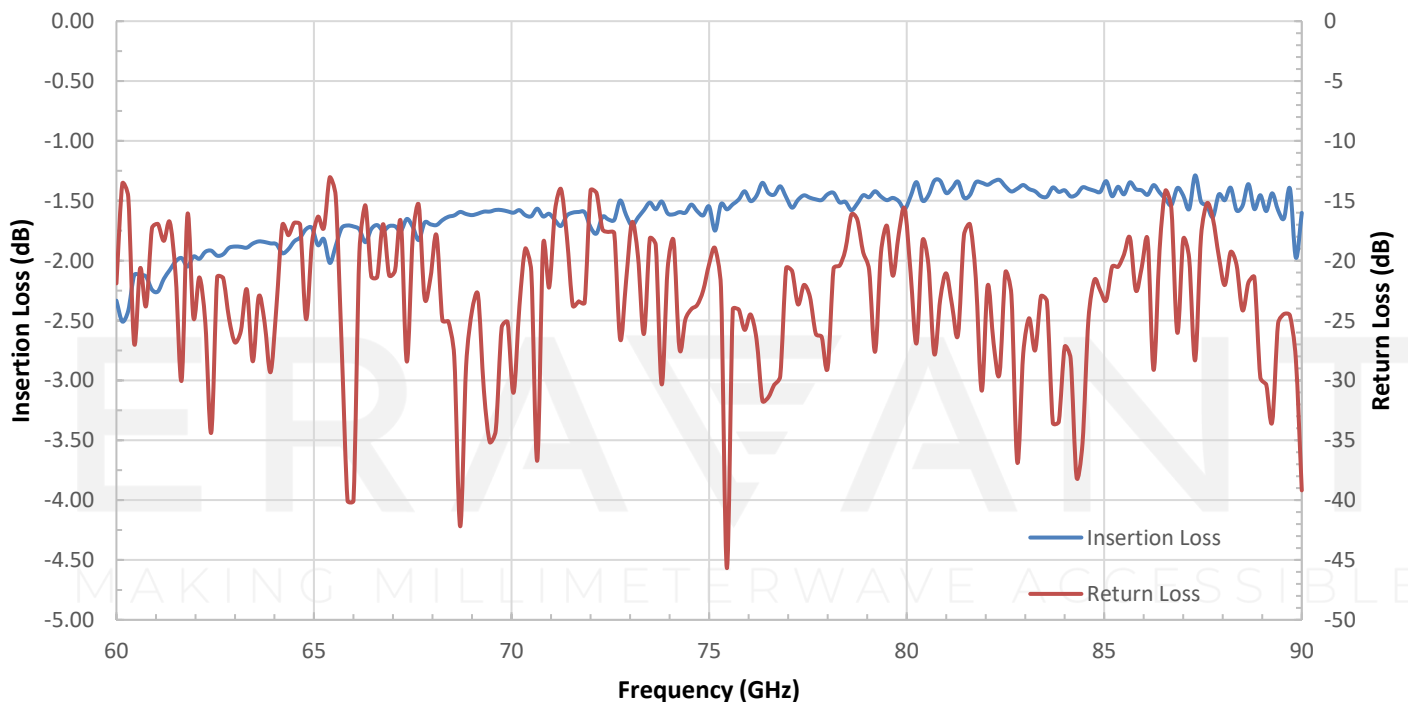


## SWJ-12-T81-3P

Typical Insertion Loss and Return Loss vs. Frequency (Port 7)

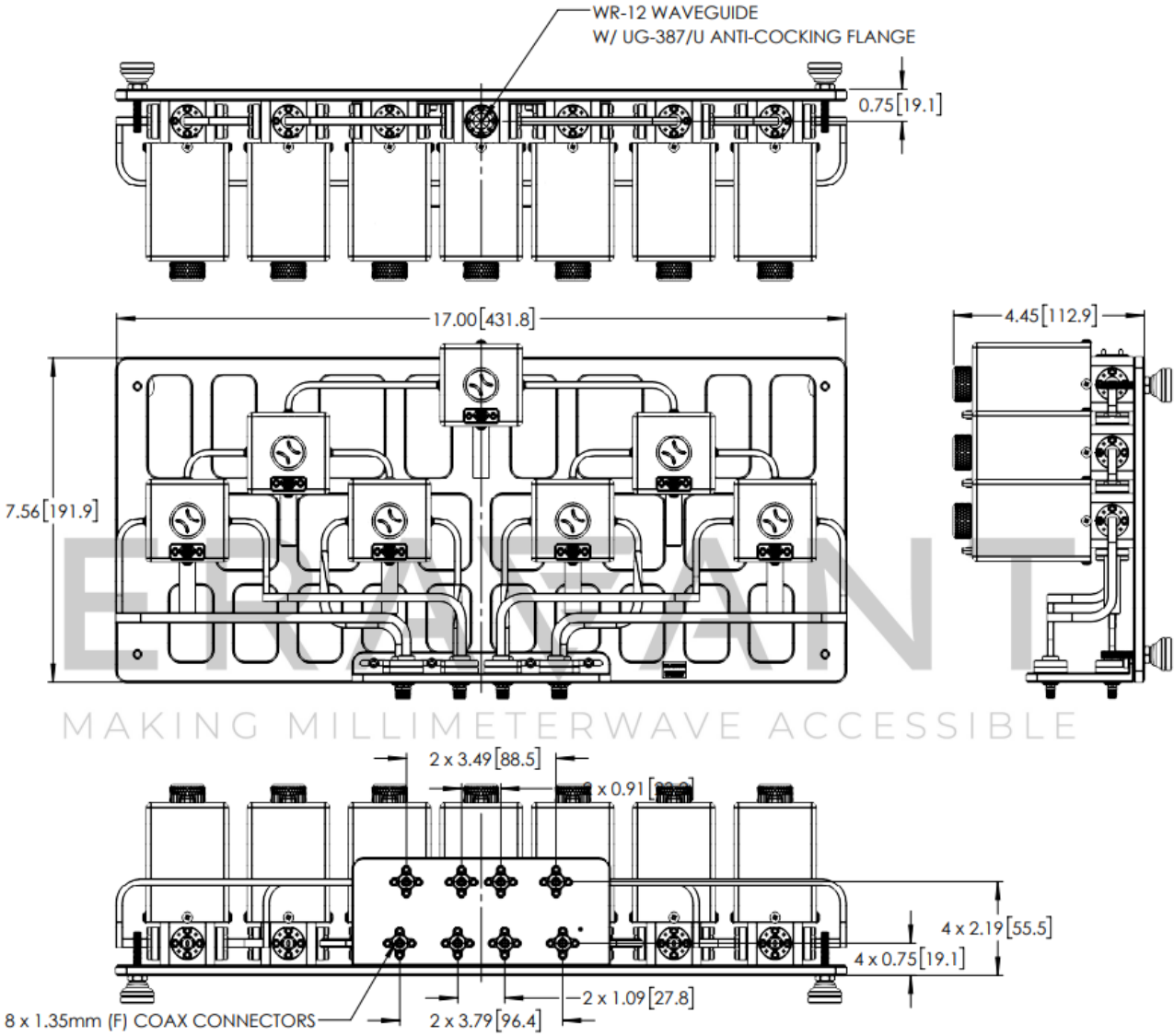


Typical Insertion Loss and Return Loss vs. Frequency (Port 8)



## SWJ-12-T81-3P

**Mechanical Outline:** (Unless otherwise specified, all dimensions are in inches [millimeters])



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### NOTE:

- All data provided is collected from a sample lot. Actual data may vary slightly from unit to unit. All testing is performed under +25 °C room temperature.
- Eravant reserves the right to change the information presented without notice.

### CAUTION:

- Always apply the +28 VDC first before applying the TTL to avoid the circuit instability, which could cause the switch damage.
- The switch is a static sensitive device. Always follow ESD rules when working with the switch.
- Any foreign objects in the waveguide will cause performance degradation and may damage or destroy the unit.
- For 1.35 mm, 1.85 mm, 2.4 mm, 2.92 mm, and SMA connectors proper torque should be applied:  $8.0 \pm 0.15$  inch-pounds ( $0.90 \pm 0.02$  Nm). Torque wrench model SCH-08008-S1 is highly recommended.

### Switching Time:

Switching time refers to the “on” time and “off” time. As illustrated below, the “on” time begins when a 50% control pulse is applied and ends when 90% of the RF signal is achieved. On the other hand, the “off” time begins when the control pulse drops below 50% and ends when 90% of the RF signal disappears. The switching time is related to the electro-mechanical configuration and TTL driver characteristics of the switch. It is not operation speed. For instance, the minimum time needed to switch back and forth is up to 0.5 second, i.e., 2 times per second for SWJ series motorized switch if operating continuously. The higher the switching speed, the more stress applied and the less cycle time (shorter life) of the switch is.

